



Massachusetts Department of Environmental Protection

Source Water Assessment and Protection (SWAP) Report

for Yankee Atomic Electric Company

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department
of Environmental
Protection, Bureau of
Resource Protection,
Drinking Water Program

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Table 1: Public Water System (PWS) Information

<i>PWS Name</i>	Yankee Atomic Electric Company
<i>PWS Address</i>	Yankee Road
<i>City/Town</i>	Rowe, Massachusetts
<i>PWS ID Number</i>	1253001
<i>Local Contact</i>	Mr. Kenneth Dow
<i>Phone Number</i>	413-424-5261

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA</i>	<i>Source Susceptibility</i>
Well #2	1253001-02G	200	504	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Yankee Atomic Electric Company's (Yankee Atomic) former nuclear power station is located in Rowe, a small, rural community in northwestern, Massachusetts along the Vermont border. The facility was a small nuclear power generation station, the third built in the country and the first in New England. The facility stopped generation in 1992 and is in the final stages of being decommissioned and dismantled; the anticipated date of completion is 2005. The current staff is approximately 200 people per day and the facility is served by a single potable supply well (02G) located at the facility. The

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

original well #1 (01G) was abandoned and decommissioned as part of the facility decommissioning process. Rowe does not have public water or municipal wastewater sewers available and therefore, the facility is served by an on-site water supply and septic disposal. Numerous local, state and federal programs regulate activities at the facility. Some of those regulatory programs are: the Massachusetts Department of Public Health radiation control program, and MA DEP air quality, solid waste, industrial wastewater, hazardous waste, water supply, wastewater, and waste site cleanup programs. In addition, the federal regulatory programs include, but are not limited to the National Pollution Discharge Elimination System (NPDES), the Nuclear Regulatory Commission (NRC), the Resource Conservation and Recovery Act (RCRA), and the Toxic Substance Control Act (TSCA).

The Zone I is the protected area immediately surrounding the well, while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual (Zone II) recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii for this facility's well are 200 feet and 504 feet, respectively, based on an approved withdrawal rate as determined through the New Source Approval Process.

The overburden in the area is comprised of glacially derived stratified drift and till of varying thickness (0 to 246 feet) over the bedrock; limited stratified drift and alluvium are deposited along the adjacent Deerfield River. The bedrock in the area is mapped as the Hoosac formation, a lower Cambrian age gneiss. Well 02G is approximately 280 feet deep, set into sound bedrock beneath 246 feet of glacial till. Although there is some evidence of a protective barrier of thick till, the confining unit is highly variable in the vicinity of the well, as bedrock exposure is noted at various locations on site. Therefore, the Department has determined this well to have a high vulnerability to contamination due to the absence of a continuous, hydrogeologic barrier throughout the recharge area that can prevent contaminant migration from the surface. Please refer to the attached map of the Zone I and IWPA.

The water from the well is presently not treated prior to distribution. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1. Refer to Table 2 for additional information regarding the location of the well and activities within the protection areas.

Table 2: Table of Activities within the Water Supply Protection Areas for Both Sources

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Nuclear Power Plant (former, partially dismantled)	No	Yes	High	Radiological activities are controlled and regulated by NRC and DPH.
Hazardous materials storage and use	No	Yes	High	Continue the use of BMPs and coordinate with emergency responders.
LQG	No	Yes	High	Hazardous materials handling
Fuel storage (ASTs)	No	Yes	Moderate	Continue the use of BMPs and coordinate with emergency responders.

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Transportation corridor and parking	No	Yes	Moderate	Ensure stormwater from the site is directed downgradient and away from the well.
Transmission lines	Yes	Yes	Low	Use only mechanical means of vegetation control.
Confirmed hazardous waste release site	No	Yes	--	Refer to MA DEP BWSC files for progress on remediation and Appendix C.

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

2. Discussion of Land Uses in the Protection Areas

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

The Zone I protection area for Well #2 is in compliance with the DEP restrictions that allow only water supply related activities or other non-threatening activities to be conducted within the Zone I. However, the IWPA includes parts of the facility including hazardous materials storage and use, fuel storage (ASTs only), internal roads and parking, and radiological control and storage area. All site activities are immediately adjacent to the protection areas including solid waste (non-radiological) disposal areas, wastewater disposal, etc.

Key issues include:

1. Hazardous materials storage and use.

The overall ranking of susceptibility to contamination for the Yankee Atomic water system is high, based on the presence of several moderate and high threat ranked land use or activity in the IWPA and immediately adjacent to the IWPA. Please refer to Table 2 for more details.

1. Hazardous Materials Storage and Use – Yankee Atomic utilizes and stores hazardous materials and generates hazardous waste. The Site Closure Project Plan, (Rev. 1, Oct. 20, 2003) addressed issues of compliance with local, state and federal requirements. Information regarding the observations and subsequent actions related to various closure issues are addressed in the recent update. At the time of the assessment, hazardous materials appeared to be handled appropriately. There is detailed documentation of procedures for handling of hazardous materials, both radiological and non-radiological. Spill kits and signs designating areas of storage were noted during the visit. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground. For details regarding compliance with the various MA DEP programs refer to the closure plan and the individual MA DEP program in the Springfield Regional office at (413) 784-1100.

Hazardous Materials Storage and Use Recommendations:

- V Continue current management of hazardous materials on site and consider relocation of the well to minimize any potential threat from an accidental release at the site.
- V Continue to comply with all local, state, and federal regulatory requirements for restoration of the site.
- V Contact Rick Larson 413-2207 or Tony Zaharias 413-755-2122 with questions regarding the UIC program.
- V Refer to the following Yankee Atomic Electric Company web sites for additional information and for updated reports <http://www.yankee.com/siteclosure/index.htm> <http://www.yankee.com/> regarding the progress of the decommissioning.

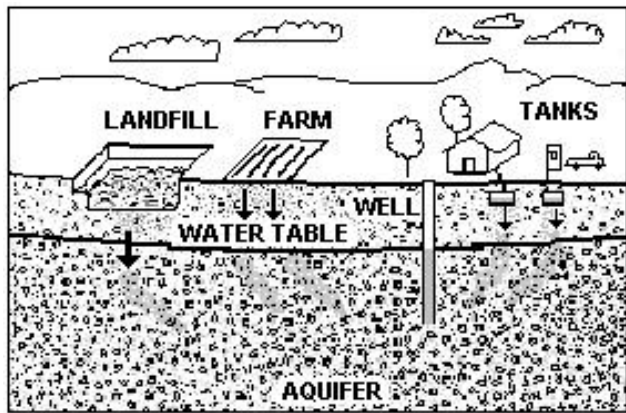


Figure 1: Example of how a well could become contaminated by different land uses and activities.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/ including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Training and Education:

- ✓ Continue staff training on proper hazardous material use, disposal, emergency response, and best management practices.
- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.

Planning:

- ✓ Update the assessment as the dismantling and decommissioning progresses.
- ✓ Work with local officials in Rowe to develop an Aquifer Protection District and Bylaws for compliance with 310 CMR 22.000 to include your and other IWPAs in that district.
- ✓ Have a plan to address short-term water shortages and long-term water demands.
- ✓ Keep the phone number of a bottled water company readily available in the event of an emergency.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at: www.state.ma.us/dep/brp/dws/.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheets
- List of Regulated facilities in the protection areas

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. Review and consider adopting the key recommendations above and the following:

Priority Recommendations:

- ✓ Comply with all local, state and federal regulations for closure and site remediation.

Zone I:

- ✓ Prohibit any non-water supply activities from the Zone I.
- ✓ Continue to conduct regular inspections of the Zone I. Inspect the well cap to ensure it is secure and the seal is intact.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
	Yankee Electric	Yankee Road	Rowe	Hazardous Waste Generator (Waste oil)	LQG	Power plant
				Hazardous Waste Generator (Hazardous waste)	LQG	Power plant
				Recycling	BUD	Solid Waste
				Air Quality	BLW-AQ	Air Emissions
				Solid Waste	LF	Solid waste
				Surface Water Discharges	SW	Stormwater and Process Water

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
1-0013411	Yankee Atomic Electric	Rowe	Hazardous materials

For more location information, please see the attached map. The map lists the release sites by RTN.

W:\...\SWAP Docs\Rowe 1253001 SWAP 2003-11-25-03.doc